Seagate

Seagate Technology, Inc.
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Seagate

Decathlon 850

ATA Interface Drive

Installation Guide

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Read before you begin...

Application. Your Seagate® drive is designed for IBM AT and compatible personal computers. It uses the ATA interface. It is intended for use with UL-listed computers or similar products.

Warning. Turn off the computer before you open the case, touch any internal components or install the drive.

Static discharge. Your drive and computer contain components that can be damaged by static discharge. Static electricity is generated when two contributors rub together. The charge is stored in your body and discharged when you touch another conductor. Wool, synthetic clothing, carpets and plastics—including most plastic bags—are common static buildup contributors. Observe the following precautions to avoid damage from static discharge:

- Ground yourself before handling the drive. Wear a ground strap that is properly connected to earth ground, or touch the metal of a power supply that is plugged into a wall outlet.
- Keep the drive in its antistatic bag until you are ready to install it. Do not attach any cables to the drive while it is in its bag.
- Handle the drive gently and only by its edges or frame. Place it on an antistatic surface until you are ready to install it.
- Do not touch the drive's connector pins or printed circuit board.

Drive handling. The drive is extremely fragile—handle it with care. Do not remove any labels from the drive.

Inspection. After you are familiar with the handling precautions listed above, inspect the drive. If it appears to be damaged, call your distributor or dealer immediately.

Warranty. See your authorized Seagate distributor or dealer.

Note. Seagate expressly disclaims all warranties, whether oral or written, express or implied, including without limitation warranties of merchantablity or fitness for a particular purpose. In no event will Seagate be liable to you, your customers or other users in any way based on loss of data or use of the software or indirect, incidental, consequential, special, or exemplary damages arising out of or in connection with the use or inability to use the software.

Maintenance and repair. Seagate drives do not require maintenance. The head/disc assembly is sealed; a broken seal voids the warranty. Seagate customer service centers are the only facilities authorized to repair Seagate drives. Seagate does not sanction any third-party repair facilities.

Installation and 32-bit disk access software

Free installation software and a 32-bit disk access software driver for Windows are stored on the hard disc at the factory. The installation software, a version of EZ-Drive for Seagate, provides a solution for computers with BIOSs that limit the accessible drive capacity to 528 Mbytes. It allows your computer to access the Seagate drive's full capacity.

SEG32BIT is a 32-bit disk access software driver that can replace the native Windows 32-bit disk access driver. It extends Windows 32-bit disk access support to drives that support capacities above 528 Mbytes, multiple block read/write , PIO modes 3 and 4 and logical block addressing (LBA).

Before you partition and format the drive, transfer the software to a bootable diskette. Seamove, an easy-to-use program on the drive, transfers the software to a diskette in Drive A. Instructions for formatting the diskette and using the transfer program are on page 17 and in the README.EXE file on the drive.

Quick software transfer for experienced users

1. Install the drive and turn the computer on.
2. Enter System Setup (your computer may call it CMOS or BIOS setup). Select drive-type 2 for the new Seagate drive.
3. Boot the computer with a bootable, blank diskette for transferring the files.
4. Activate the prompt for the new Seagate drive.
5. Type **seamove** and press ENTER. Seamove transfers the software to the diskette in Drive A, erases the drive partition and reboots the computer.

FCC and agency compliance

Your Seagate drive is intended to be contained solely within a personal computer or similar enclosure (not attached to an external device). As such, the drive is considered a subassembly and no Federal Communications Commission authorization, verification or certification of the device is required.

Seagate Technology, Inc. has tested these drives in an enclosure as described above to ensure that the total assembly (enclosure, disc drive, motherboard, power supply, etc.) does comply with the limits for a Class B computing device, pursuant to Subpart J of Part 15 of the FCC rules. Operation with noncertified assemblies is likely to result in interference to radio and television reception.

Radio and television interference. This equipment generates and uses radio frequency energy and, if not installed and used in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception.

This equipment is designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio or television, which can be determined by turning the equipment on and off, you are encouraged to try one or more of the following corrective measures:

- Reorient the receiving antenna.
- Move the device to one side or the other of the radio or TV.
- Move the device farther away from the radio or TV.
- Plug the equipment into a different outlet so that the receiver and computer are on different branch outlets.

If necessary, you should consult your dealer or an experienced radio/television technician for additional suggestions. You may find helpful the following booklet prepared by the Federal Communications Commission: *How to Identify and Resolve Radio-Television Interference Problems.* This booklet is available from the Superintendent of Documents, US Government Printing Office, Washington, DC 20402. Refer to publication number 004-000-00345-4.

Note. This digital apparatus does not exceed the Class B limits for radio noise emissions from computer equipment as set out in the radio interference regulations of the Canadian Department of communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de Classe B prescrites dans le règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

Sicherheitsanleitung

1. Das Gerrät ist ein Einbaugerät, das für eine maximale Umgebungstemperatur von 55°C vorgesehen ist.
2. Zur Befestigung des Laufwerks werden 4 Schrauben 6-32 UNC-2A benötigt. Bei seitlicher Befestigung darf die maximale Länge der Schrauben im Chassis nicht mehr als 3,3 mm und bei Befestigung an der Unterseite nicht mehr als 5,08 mm betragen.
3. Als Versorgungsspannugen werden benötigt:
   +5V ± 5% 0,6A
   +12V ± 5% 0,8A (1,9A fur ca. 30 Sek. fur ± 10%)
4. Die Versorgungsspannung muβ SELV entsprechen.
5. Alle Arbeiten auf dem Festplatte dürfen nur von Ausgebildetem Servicepersonal durchgeführt werden. Bitte schaffen Sie Festplatteetiketten nicht weg.
6. Der Einbaudes Drives muβ den Anforderungen gemäβ DIN IEC 950V DC 0805/05.90 entsprechen.

Drive capacity

The BIOS your computer uses can limit the effective capacity of your disc drive. (This document assumes you are using a DOS operating system. If you are using another operating system, refer to its user's guide regarding disc drive installation and parameters.) It creates a representation of the drive's surface that allows the computer to store and retrieve data. Recent developments in disc drive technology have allowed for increased physical capacity. However, parameter restrictions in some BIOSs limit the size of the representation to 528 Mbytes. The full 854-Mbyte capacity of the ST5850A is not accessible when this limit is imposed. Here are some solutions for surpassing this barrier:

- Upgrade the BIOS to one that uses logical block addressing (LBA) or a cylinder-head-sector (CHS) addressing scheme that allows for more than 528 Mbytes.
- Use a host adapter that supports more than 528 Mbytes.
- Install the drive configured for dual-drive emulation. This feature makes the drive two logical drives for the computer. Each logical drive is assigned a drive type in System Setup and is partitioned and formatted. A second, physical drive cannot be used when dual-drive emulation is used.
- Use the free EZ-Drive installation software that is stored on the drive at the factory or an equivalent. (See page 17 for instructions on transferring the software to a diskette. See page 24 for instructions on installing and using EZ-Drive.)

Before you install your drive, evaluate your system to determine the best installation strategy. This manual discusses standard setup, dual-drive emulation and EZ-Drive installation processes.

Installing the drive

Note. Throughout this manual the Decathlon 850 is referred to by its model number, ST5850A.

This instruction guides you through the two stages of drive installation. The first stage involves configuring the drive and attaching it to the computer. The second stage involves configuring the computer to recognize the drive. After you have attached the drive to the computer, we recommend that you transfer the free installation and 32-bit disk access driver software to a diskette. Instructions for transferring the files are on page 17.

Configuring the drive

The printed circuit board on your drive may be either of two styles. This guide differentiates the drives as Type A and Type B. They can be distinguished by the length of the options jumper block (J8) connector. Type A drives use a 12-pin connector and are represented by Figures 1 and 2 on pages 8 and 9. Type B drives use a 34-pin connector and are represented by Figures 3 and 4 on pages 12 and 13.

The options jumper block (J8) is used to configure the drive for your computer. You can configure the drive for the following conditions:

- For one- or two-drive operation
- To be the master or slave drive
- For computers using cable-select
- To use a remote drive-activity LED

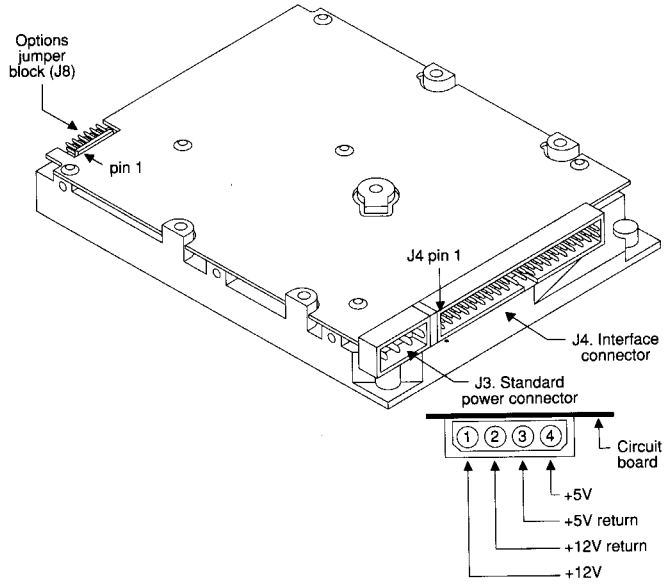


Figure 1. Type A connectors and jumper block

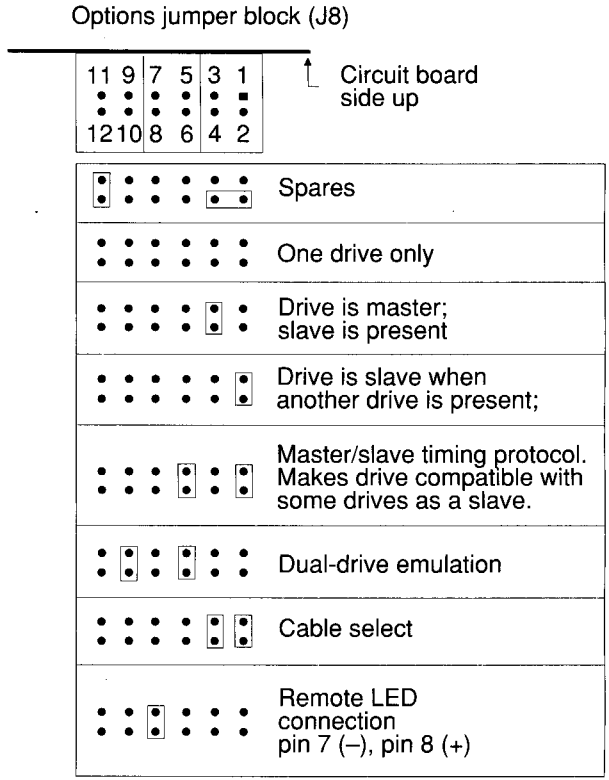

Options jumper block (J8)
11 9 7 5 3 1
12 10 8 6 4 2
Circuit board side up
Spares
One drive only
Drive is master; slave is present
Drive is slave when another drive is present;
Master/slave timing protocol. Makes drive compatible with some drives as a slave.
Dual-drive emulation
Cable select
Remote LED connection pin 7 (–), pin 8 (+)

Figure 2. Type A configuration settings

1. **Turn the computer off.**

   Warning. Installing or removing the drive or adapter cards while the computer is powered on can damage your drive, adapter and computer.

2. **Remove the computer's cover.**

   Caution. Special training or tools may be required to service laptop computers. Removing the cover may void your warranty. Review the terms and conditions of your warranty before removing the cover.

3. **Ground yourself.**
4. **Remove the drive from its antistatic bag.** You must be grounded at all times when handling the drive.
5. **Configure the drive.** The drive configuration options are listed below. If you have a Type A drive, refer to Figure 2 on page 9 for the corresponding jumper settings. If you have a Type B drive, refer to Figure 4 on page 13 for the corresponding jumper settings.

   Note. Use the spare jumpers on the options jumper block (J8) to configure your drive. The jumpers are 2-mm connectors. If you need additional jumpers, use Seagate part number 13211-001 or equivalent.

   One-drive only. Use this configuration if there are no other drives attached to the hard disc controller.

   Master with slave present. Use this configuration if the drive is the first hard drive in the system. The Drive C partition is placed on the master drive.

Slave. Use this configuration if the drive is the second drive in the system.

Master/slave timing protocol. This protocol involves the communication between the computer and the disc drives during the power-on cycle only. The computer queries the master drive for the status of both drives. The slave must report its status to the master within a certain time period. If it does not respond in time or if it uses a response signal, the master does not acknowledge, the master tells the host that the slave has timed out, and the computer does not recognize the slave. The Seagate drive is shipped configured to work with other drives that comply with the ATA-standard master/slave timing protocol.

This setting allows the Seagate drive in the slave position to respond to some drives that use a different protocol. Try using this setting if the slave is not identified after power-on.

Dual-drive emulation. This feature is one option for surpassing the 528-Mbyte barrier imposed by some BIOSs. It makes the drive look like two drives with under 528 Mbytes each to the computer. Both drive-type options must be configured in System Setup, and each logical drive must be partitioned and formatted. A second, physical drive cannot be attached to the hard disc controller. You cannot use dual-drive emulation with cable select.

Cable-select. Use this configuration if your computer uses cable-select.

Remote LED. Use this setting to connect a remote drive-activity LED. See "Attaching a remote LED cable" on page 14 for instructions on the proper way to install the LED.

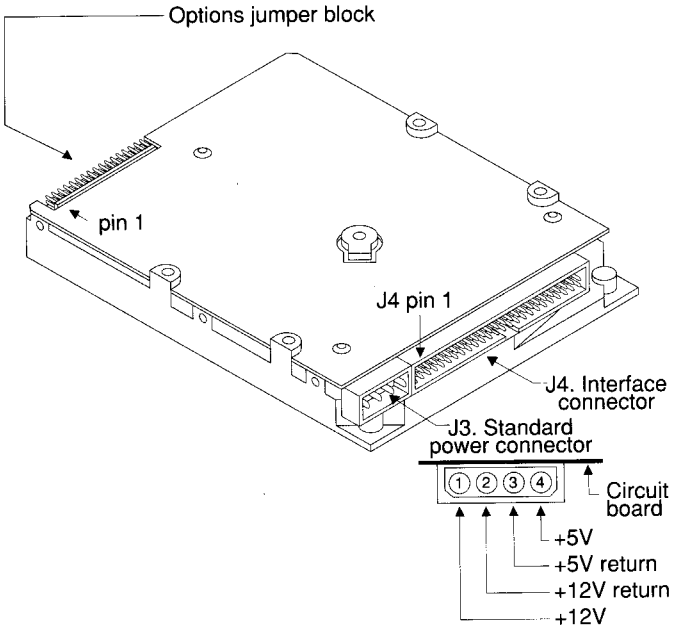
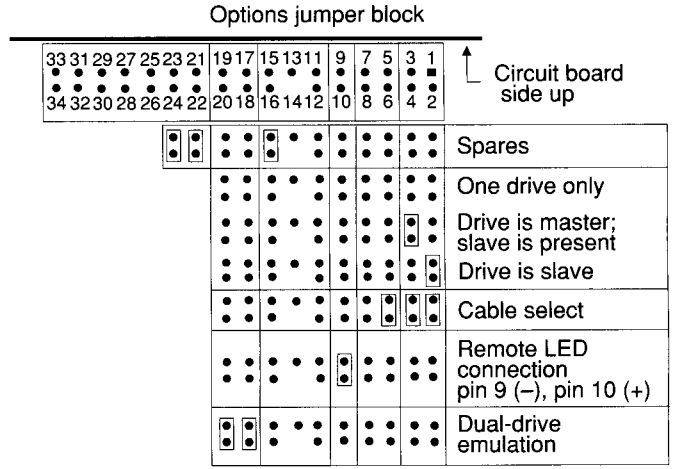


Figure 3. Type B connectors and jumper block


Options jumper block
33 31 29 27 25 23 21 19 17 15 13 11 9 7 5 3 1
34 32 30 28 26 24 22 20 18 16 14 12 10 8 6 4 2
Circuit board side up
Spares
One drive only
Drive is master; slave is present
Drive is slave
Cable select
Remote LED connection pin 9 (–), pin 10 (+)
Dual-drive emulation

Note. All other pins are reserved. Do not use them.

Figure 4. Type B configuration settings

Attaching cables

This section refers to Figure 1 on page 8 for Type A drives and Figure 3 on page 12 for Type B drives for the connector locations.

1. **Attach a remote LED cable.** If your computer's drive-activity LED uses a cable, place the connector end attached to the ground wire, usually the black wire, to the (–) pin and the other end to the (+) pin of the options jumper block (J8). For the correct orientation of the pins, refer to Figure 2 on page 9 for Type A drives or Figure 4 on page 13 for Type B drives. The LED can be damaged if the cable is attached incorrectly. You may need to replace the connector on the LED cable.
2. **Attach a power-supply cable to the drive.**

Caution. The cable and connector are designed to mate. Do not force a connection. Improper alignment can damage your drive.

3. **Attach the interface cable.** The interface cable's edge-stripe denotes pin 1. The cable must be no longer than 18 inches.

Caution. The cable and connector bond is delicate. Pulling the cable to remove the connector can damage the cable.

Installing one drive with a standard ATA 40-pin interface cable:

Attach one end of the cable to the drive's 40-pin ATA interface connector. Align the cable's edge-stripe with pin 1 of the drive. Attach the other end of the cable to the host adapter card or to the hard-drive connector located on the motherboard. Align the cable's edge-stripe with pin 1 (see your system user's guide or host adapter user's guide).

Installing two drives with an ATA interface cable:

The interface cable must be designed for two drives. Attach a cable connector to each drive's 40-pin ATA interface connector. Align the cable's edge-stripe with pin 1 of the drive. Attach the other end of the cable to the host adapter card or to the hard-drive connector located on the motherboard. Align the cable's edge-stripe with pin 1 (see your system user's guide or host adapter user's guide). You can attach the drives in any order on the cable.

Cable-select installation:

Refer to your computer's user's guide to determine which interface connector is used for the master and which is used for the slave.

Mounting the drive

The drive fits in the standard 3.5-inch bay. Use four 6-32 UNC-2A screws (not included) in either the side mounting holes or the bottom mounting holes, shown in Figure 5 on page 16, to mount the drive. You can mount the drive securely in any orientation. Position the drive so cables are not strained or crimped.

Caution. To prevent drive mounting-hole damage, use only the type of screws specified.

Bottom mounting holes. Insert four mounting screws not more than 0.20 inches (6 full turns) into the drive frame.

Side mounting holes. Insert four mounting screws not more than 0.20 inches (6 full turns) into the drive frame.

This completes the physical installation.

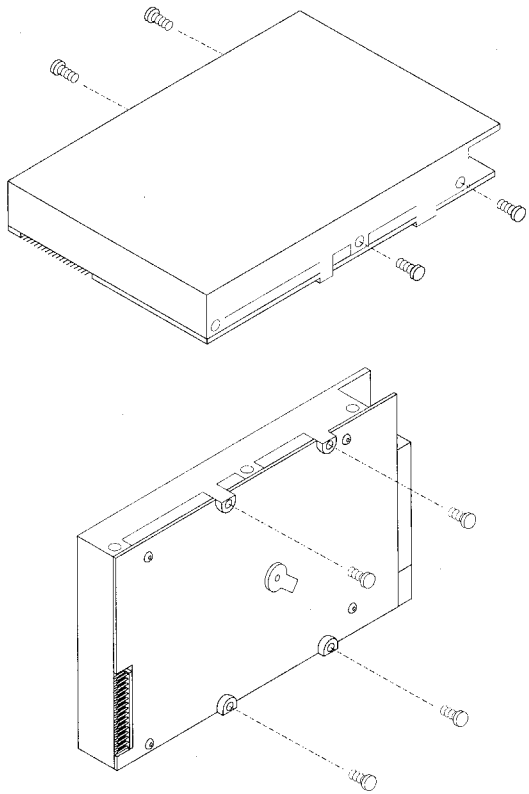


Figure 5. Mounting holes

Transferring the free installation software

Before you configure the computer and partition and format the drive, transfer the installation software and the 32-bit disk access software driver from the Seagate drive to a bootable diskette in Drive A. The files stored on the drive include:

- **Seamove.** This program decompresses and transfers the software and README files to a bootable diskette in Drive A. It also removes the factory-installed partition and format.
- **EZ-Drive.** This installation software enables computers with BIOSs that limit the hard disc capacity to 528 Mbytes to surpass the 528-Mbyte barrier.
- **SEG32BIT.386.** This is a replacement 32-bit disk access software driver that extends 32-bit disk access capability in Windows to drives with capacities greater than 528 Mbytes.
- **README.** This file contains information about the Seamove transfer program.

To transfer the software, you must put a bootable, blank diskette into Drive A. To create a bootable diskette:

1. Insert your DOS diskette into Drive A.
2. Type **format a:/s**.

   The drive reads the DOS diskette and prompts you to insert the diskette you want to format into Drive A.
3. Insert the blank diskette. Press ENTER. When the format is complete, you can transfer the installation software files to the diskette.

To transfer the software files:

1. Boot the computer with the diskette to which you want to transfer the installation software files.
2. Enter the System Setup routine. (Refer to your computer's user's guide. System Setup may be called Setup, BIOS Setup or CMOS Setup.) If your computer uses an automatic setup system, go to step 5.
3. Find the hard disc configuration in the System Setup screen.
4. Select drive type 2 for your new Seagate drive. If your computer does not offer drive type 2, use the following values: 615 cylinders, 4 heads and 17 sectors.

   Note. These are interim drive-type values that allow you to access the drive for extracting the installation files.
5. Activate the prompt for the Seagate drive.
6. Type **seamove** and press ENTER.

   This command transfers the files from the drive to the diskette in Drive A. When the transfer is complete, the files are erased, the drive partition is removed and the computer is rebooted. The computer returns an invalid drive specification error when you try to access the drive.

Caution. Do not write-protect the EZ-Drive diskette. The EZ-Drive program writes important information back to the diskette during the installation.

This completes the file transfer.

Configuring the computer

Your computer maintains a record of the hardware inside it. The record is stored in the CMOS memory chip and is used by the BIOS. When you boot your computer, a test is run comparing the record to the hardware. After you have installed the new drive, you must update this record to show the new drive's translation geometry. The strategy you use to configure your system depends on the capability of your computer. If your computer is capable of using more than 528 Mbytes, use its standard method for configuration. See your computer's user's guide for instructions on how to open and update the System Setup record. If your system is limited to 528 Mbytes, you can use dual-drive emulation or the free installation software, EZ-Drive, stored on the drive. If you have not copied the software to a diskette, do so, now, before you partition and format the drive. Transfer instructions are on page 17.

Standard setup

1. Turn the computer on.
2. Enter the System Setup routine. (Refer to your computer's user's guide. System Setup may be called Setup, BIOS Setup or CMOS Setup.)
3. Find the hard disc configuration in the System Setup screen.
4. Select a drive type that matches the drive translation geometry for your drive as shown in the table.

Model	CHKDSK Mbytes	Translation geometry			CMOS (Setup) Mbytes
		Cyl	Heads	Sectors per track	
ST5850A	854.6[1]	1,656	16	63	815[2]

Note. CHKDSK and CMOS capacities are approximations. The capacities your computer reports may vary slightly.

If none of the standard drive types offered in System Setup match the translation geometry of your Seagate drive, select the *user-defined or custom* drive type, if available, and enter your drive's translation geometry.

If a user-defined drive type is not offered, select a drive type that approximates, but does not exceed, the *CMOS (Setup) Mbytes* capacity in the translation geometry table above.

Note. The drive does not use write precomp and landing zone. If these parameters are listed, make their values zero.

If you upgrade your system at a later date to achieve the drive's full capacity, you must repartition and reformat the disc. Be sure to save your data first.

5. When you have completed setting the translation geometry for your drive, save the values and exit System Setup. Reboot your computer. Refer to your user's guide for assistance.

1. One Mbyte equals 1,000,000 bytes.
2. One Mbyte equals 1,048,576 bytes.

Dual-drive emulation installation

Dual-drive emulation allows you to access the full capacity of the drive by making it look like two physical drives to the computer. Each drive is assigned a drive type in System Setup and must be partitioned and formatted. A second, physical drive cannot be installed when dual-drive emulation is used. To configure your computer for dual-drive emulation:

1. Follow steps 1 through 3 in the "Standard setup" section on page 19.
2. Use the translation geometry in the table for both drives.

Model	CHKDSK Mbytes	Dual-drive emulation translation geometry			CMOS (Setup) Mbytes
		Cyl	Heads	Sectors per track	
ST5850A	426	827	16	63	407

3. Save the values and exit System Setup.
4. Partition and format both drives.

Partitioning and formatting the drive

Before you can use your Seagate drive, you must partition and high-level format it. In this guide we discuss formatting your drive with DOS—refer to your DOS user's guide for assistance. If you are using another operating system, consult your operating system user's guide for formatting instructions.

Note. If you have not copied the free installation and 32-bit disk access driver software to a diskette, FDISK will detect a

partition on the drive. Only the first two cylinders are formatted by the factory to store the software files. You must partition and format the entire drive to make its full capacity available. Partitioning the drive erases all files on the drive. transfer the installation and 32-bit disk access driver software files to a diskette before you partition the drive (see the transfer instructions on page 17).

Low-level formatting

Low-level formatting is not required. The drive was low-level formatted at the factory using 512 bytes per sector.

Partitioning

You must partition the drive into one or more logical drives before you can use it.

Caution. Partitioning or formatting a drive at any level erases all data on it. Make a backup copy of your existing files on another drive before you repartition or reformat. Seagate assumes no liability if you erase your data.

You can partition a drive as follows:

1. Insert a bootable diskette into Drive A. Turn the computer on.
2. After the computer has completed booting, remove the bootable diskette from Drive A. Insert a diskette that has the FDISK utility into Drive A and type **fdisk**. Press ENTER.

   Note. If you have two drives in your system, the menu displays five options. Option five allows you to select the drive you want to partition. Make sure you select the correct drive.
3. Select *create DOS partition or logical DOS drive*. Press ENTER.

4. Select *create primary DOS partition*. Use the maximum available size for your primary partition, and make the partition active for Drive C. This puts the entire drive on one partition and allows you to load the DOS boot information on the drive. Press ENTER for each subsequent selection.

After all of the appropriate selections are made, the computer will restart itself. You must place a bootable diskette into Drive A.

High-level formatting

High-level formatting verifies the information written by the low-level format and builds the file allocation table (FAT) used by DOS to access files on the drive. If you put more than one partition on the drive, you must high-level format each partition. Refer to your DOS reference guide for instructions. Use the DOS FORMAT utility to high-level format the drive as follows:

1. Type the following command at the DOS prompt:

   format *drive:* /v /s

   drive: designates the drive you are formatting. If you are formatting the boot drive or if your system contains only one drive, type **c:**. To format a second drive, type **d:**.

   /v tells the computer to create a volume label for the partition after it is formatted. Labeling can prevent someone from accidentally deleting the partition and losing your data.

   /s tells the computer to copy the necessary system files to the drive to make it bootable.
2. When the computer prompts you for a volume label, type any valid name you want to designate the drive.

Using the installation software

Note. The EZ-Drive software is authorized for installation only with the drive on which it is shipped.

The EZ-Drive installation software allows your computer to access your Seagate drive's full capacity. It bypasses the BIOS during the boot sequence and uses information it creates on Drive C to identify the drive before DOS is loaded. During the installation, EZ-Drive:

- Determines how many drives are installed
- Enters a drive type in System Setup for the new drive
- Modifies the Drive C boot record with the new drive's translation geometry
- Partitions and formats the new drive
- Copies the boot files to the new drive if it is Drive C
- Enables Maximum Overdrive™, which enables read/write multiple in drives that have this feature. The Change Installed Features option that appears in the dialog box when the format is complete allows you to disable Maximum Overdrive.

EZ-Drive is easy and safe to use and is versatile. If you already have a drive installed, EZ-Drive will not alter its format and files unless you instruct it to override the partition and format. You can choose a fully automatic installation that establishes one partition and quick formats the drive or a custom installation that lets you set multiple partitions of equal size (see page 27 for instructions on creating multiple partitions of unequal size). You can choose a full format and other options.

Note. You must have DOS 4.0 or later to use EZ-Drive. It works in most computers but does not support:

- Toshiba laptops, XT or Micro Channel computers
- Some Local Bus adapters that use 32-bit mode
- Some systems that have PIO mode 3 or 4 active
- OS/2 and NT

Caution. Because EZ-Drive uses about 4 Kbytes of conventional memory, some older virus-detection programs may misidentify EZ-Drive as a virus. If all 640 Kbytes of conventional memory are not free when these virus programs inspect conventional memory, they assume a virus is present and clean and restore the memory. If this happens, information about the EZ-Drive installed drive is destroyed and the drive cannot be identified by the computer. Do not use these programs.

Note. The Seagate version of EZ-Drive cannot install a non-Seagate drive without a Seagate drive present.

1. Boot your computer with the EZ-Drive diskette. This is a precaution to ensure that the EZ-Drive installation does not conflict with any terminate-and-stay resident (TSR) programs that may be in memory.
2. Type **ez** and press ENTER.
3. Disregard the Notice dialog box. The EZ-Drive software is authorized for installation only with the drive on which it is shipped. Press ENTER to continue.
4. Locate the bottom box on the screen. The model number of each drive EZ-Drive identifies is listed in this box. If a drive you have installed is not listed or the drive order (Drive 0 is the

master, Drive 1 is the slave) is incorrect or there is a drive not identified message, make sure the master and slave jumpers are set correctly on the drives and the I/O and power cables are properly connected.

Note. Additional troubleshooting tips are available in the Installation Help menu.

Caution. Turn off your computer before resetting the jumpers or removing the cables.

5. If the drives are correctly identified, select Select Fully Automatic Installation in the Select Installation Type dialog box. This creates a single partition and formats the drive.

   If you are installing the drive as Drive C, EZ-Drive automatically writes the system files to the drive to make it bootable.

6. When the format is complete, the Options dialog box appears. Select and read Important Information. This instruction tells you how to boot from the floppy and still retain the use of the EZ-Drive installed drive.

7. Select Reboot to reboot the computer and save the installation. Remove the EZ-Drive diskette and put it away. It contains information about the drive setup.

Toward the end of the boot sequence, your screen should display a prompt for booting with a diskette followed quickly by the Micro House banner and the C: prompt. If the boot prompt and the banner fail to appear, your computer has not recognized the EZ-Drive installed drive. Retry the installation. If the drives are correctly identified, choose Select Fully Automatic Installation in the Main menu dialog box above. This puts a single partition on the drive and formats it.

Booting with a diskette after EZ-Drive is installed

Because EZ-Drive bypasses the BIOS to install your drive, the computer does not recognize the drive when you boot directly to a diskette. To boot your computer with a diskette:

1. Boot the computer with the diskette-drive door open.
2. Press the CTRL key when the following message appears near the end of the boot sequence:

   Hold the CTRL key down to boot from a floppy

3. Insert the boot diskette. The computer boots to the diskette drive.

Installing multiple partitions

The custom installation option in the installation menu allows you to create up to nine partitions of equal size on the drive. To create partitions of unequal size on your EZ-Drive installed drive, use the FDISK and FORMAT commands on a DOS diskette. Refer to your DOS manual if you need assistance deleting, creating and formatting partitions. This instruction assumes you have already installed the drive with EZ-Drive.

1. Boot your computer from Drive C. The computer uses the information on Drive C to identify the EZ-Drive-installed drive.
2. Insert a bootable diskette that has the FDISK and FORMAT programs on it into Drive A and change the prompt.
3. Type **fdisk**.
4. Delete the primary partition from the EZ-Drive installed drive.

   Caution. If you have two drives, be sure you choose the correct drive before deleting the partition. Deleting the partition erases everything on the drive.

Note. EZ-Drive puts a volume label on the partition it creates. You must enter the label name to delete the partition.

5. Repartition the drive with the partitions in the sizes you want. Refer to your DOS manual if you need assistance creating extended partitions. Remember to make the Drive C primary partition active.

The computer will reboot when the partition process is complete. However, you must make sure the EZ-Drive installed drive is present to continue with the format. (The EZ-Drive banner appears when the drive is recognized.)

1. Remove the diskette while the computer reboots. Press the CTRL key when the following message appears:

   Hold the CTRL key down to boot from a floppy

   The message is very quick and you may need to boot several times before you succeed. (Some computers allow you to press the CTRL key early.) If you get an "Invalid OS" error message, the computer has not found the EZ-Drive installed drive, and you must start the boot process again.
2. Reinsert the diskette.
3. Type **format drive:** for each partition you have created.

   Note. DOS automatically assigns a letter to each partition. Use the appropriate letter in the format statement.

   If you are formatting Drive C, you must copy the system files for the computer to boot from the drive. To copy the system files during the format, type **format c: /s**.
4. Reboot the computer when you are done formatting.

Windows 32-bit disk access

If 32-bit disk access is enabled in Windows, an error message appears when you load Windows after you have installed a drive larger than 528 Mbytes. The Windows 32-bit disk access driver must be turned off for you to open and use Windows. Use the Seagate replacement driver, SEG32BIT.386, to restore 32-bit disk access capability. To open Windows and restore 32-bit disk access:

1. Press ENTER to open Windows.
2. Open the Main menu.
3. Open the Control Panel.
4. Select Virtual Memory.
5. Select Change.
6. Deselect 32-Bit Disk Access at the bottom of the screen to turn the feature off.
7. Select OK. Follow the screen instructions to reboot.

You can re-establish the 32-bit disk access capability using the SEG32BIT program on the Seagate software diskette as follows:

1. Load Windows.
2. Open the Program Manager menu and select File.
3. Select Run.
4. Load the EZ-Drive diskette.
5. In the command line box, type **drive:stsetup**.
6. Read the license agreement that appears on the screen. Select ACCEPT AGREEMENT to continue.

7. The next screen lists the features the SEG32BIT.386 driver supports. If your computer supports these features, they will be active in 32-bit disk access mode with SEG32BIT.386 for all drives that support them. Select Install Driver to continue.
8. Once the driver is installed, you must enable the 32-bit disk access option in the Windows Control Panel to make it operational. You can choose to enable the option now or later. If you choose to enable the driver now, the program opens the Windows Main menu. Repeat steps 3 through 7 to enable SEG32BIT 32-bit access.

Basic troubleshooting

Warning. Always turn off the computer before changing jumpers or unplugging cables and cards.

Caution. Your drive and computer contain static-sensitive devices. Wear a ground strap or take other antistatic precaution while handling your drive.

If you have installed your drive and it does not function properly, perform the following basic checks:

- **Verify compatibility.** Verify that the host adapter and the drive are appropriately matched to each other and to your computer. Refer to relevant documentation for details.
- **Check all cards.** Verify that all cards are seated in their slots on the motherboard and are secured with mounting screws.
- **Check all cables.** Make sure all ribbon and power cables are securely connected. Ribbon cables are easily damaged, especially at the connector. Try a new cable or a known good cable. Make sure no socket pins were bent when the cable was inserted. For each cable, verify that cable-connector pin 1 is aligned with equipment-connector pin 1. The edge-stripe on the ribbon cable is used to denote pin 1.

  Caution. Do not reverse-plug connectors. This can damage the computer and the drive.
- **Verify equipment configuration.** Review the instructions in this guide and the host adapter installation guide and make sure that all appropriate jumpers are installed, or removed, to suit your application.

- **Check the power-supply specifications.** If new devices are installed, your computer's power supply may not support the new total power requirement. Consult your dealer.
- **Verify the drive type setting in System Setup.** The drive type stored in CMOS memory by your System Setup program must not exceed the physical specifications of your drive. Also, if you have a large-capacity drive, the translation geometry settings must not exceed the limitations set by the operating system and BIOS.
- **Check for viruses.** Before you use someone else's diskette in your system for the first time, scan the diskette for viruses.

Advanced troubleshooting

If you have performed the preceding basic checks but the problem has not been solved, follow these guidelines for troubleshooting specific cases:

The system does not recognize the drive.

- Check all cables.
- Make sure the power supply is adequate for system needs.
- Reboot the computer and make sure the drive motor runs. If your drive is very quiet, it may be difficult to hear its discs reach operating speed. Recheck all drive cables if the drive is not running.
- Verify the System Setup drive type values. Each drive present must be represented in System Setup.
- Try a warm boot (a reboot without turning off computer power). To do this, press CTRL, ALT, and DELETE at the same time.

If the drive is recognized after the warm boot, the computer BIOS' setup test may be completing before the drive is ready.

One possible solution is to slow your computer's processor speed during startup. If your computer has a turbo switch, set it to slow speed before turning the computer on. If there is no turbo switch, you may be able to use keyboard commands to slow the processor speed; see your computer manual for details. After the computer is up and running, return the processor to the fast speed.

Another solution is to warm-boot your computer after every power-on.

- Check for I/O address conflicts. To isolate the conflict, first verify that the drive and host adapter are compatible with your computer by removing all the peripheral adapter cards (power must be off) except for the video card. Then reinstall the drive and host adapter card. If this is successful, reinstall the other peripherals one at a time until the conflict reoccurs.

  After you have isolated the source of the address conflicts, you can resolve the conflict by changing the I/O address of the peripheral that appears to cause the conflict.
- If your drive was installed with EZ-Drive, the special instruction in the boot sequence on Drive C may have been bypassed. Remove the diskette and reboot. The section "Booting with a diskette after EZ-Drive is installed" on page 27 describes how to boot with a diskette.

- If the computer does not recognize the slave drive following power-on, the slave may not be communicating with the master during the boot cycle. Try making the Seagate drive the slave and using the master/slave timing-protocol jumper configuration discussed on page 11.

The dealer partitioned and high-level formatted the drive for you in the store. Later, you installed the drive and it does not respond.

- Reboot the computer and make sure the drive spins up.
- Check all cables.
- Make sure the power supply is adequate for system needs.
- Use the same version of DOS within all partitions. Make sure the DOS version the dealer used to partition and high-level format the drive is the same as the version you have installed on your computer. If it isn't, see your dealer.
- Verify the System Setup drive type value. You must install the drive using the same drive type or translation geometry that your dealer used to partition the drive.
- Check for I/O address conflicts between peripheral cards.
- Check for viruses.

The screen remains blank when you power up the system.

- Make sure the monitor is plugged in and turned on.
- Check all cards. Make sure the video card is seated in its slot and secured with mounting screws.
- Check all cables. Make sure the video-card cables are securely attached.
- While the computer is powered down, remove the drive host adapter. If the screen turns on after you reboot, the host adapter may be incompatible or defective. If so, see your dealer.

The system hangs in FDISK or fails to create or save the partition record.

- Check all cables.
- The DOS utilities diskette may be corrupted. Try your backup DOS diskette.
- Make the partitions smaller.
- Try another drive type or translation geometry. The computer's BIOS may not accept a particular translation geometry for writing into the CMOS setup memory.
- Change the interrupt jumper setting on the host adapter.
- Check for media defects at the beginning of the drive. Use a third-party surface scan utility.
- Some BIOSs have a Track 0 protection feature that protects Track 0 from viruses. This causes FDISK to hang the system. You must disable this feature in System Setup before you can use FDISK. See your computer reference guide for assistance. Be sure to re-enable this feature when FDISK is done.

System error message, "Drive not Ready," appears.

- Check all cable connections. For each ribbon cable, verify that pin 1 of the cable is matched to pin 1 of the connector. Pin 1 is usually denoted by the edge-stripe on the ribbon cable.
- Make sure the power supply is adequate for system needs.
- Reboot the computer and make sure the drive spins up. The FDISK error message, "No Fixed Disk Present," appears.

- Check all cables.
- Make sure the power supply is adequate for system needs.
- Reboot the computer and make sure the drive spins up.
- Verify the System Setup drive type values.
- Check for I/O address conflicts.

During the DOS high-level format, the drive does not format to full capacity.

- Verify your computer's System Setup drive type values. One of the following problems may have occurred: 1) the values may be set for an incorrect drive type or translation geometry; 2) you may have entered a parameter value that exceeded the physical capacity of the drive; 3) you selected a translation geometry or drive-type that does not take full advantage of the drive's capacity; or 4) the drive's physical specifications exceed the translation geometry limits imposed by the operating system and BIOS. Refer to "Standard setup" on page 19 if any of these cases is true.

  If you reset the System Setup drive type value, you must partition and high-level format the drive again.
- If you partitioned the drive into individual logical drives, you may need to make the partitions smaller so that the computer can use all of the drive's capacity.
- If our computer supports LBA mode, you may need to enable the LBA mode function in System Setup to get the drive's full capacity. Refer to your computer's reference guide.
- You can install the drive using dual-drive emulation. Dual-drive emulation makes the drive into two logical drives for the computer. You must configure both drive types in System Setup and partition and format each logical drive separately. You cannot use a second, physical drive with dual-drive emulation.
- You can use the EZ-Drive software to install the drive.

DOS messages "Disk Boot Failure," "Non-System Disk," or "No ROM Basic - SYSTEM HALTED," appear.

- Reinstall the DOS system files using the DOS SYS utility.
- Check all cables.
- Use FDISK to verify that the primary partition is active.
- Check for viruses.

System error message, "HDD controller failure" appears.

- Confirm the jumper settings on the drive.
- Verify the System Setup drive type values.

The error message "Microsoft Windows 32-bit disk driver (WDCTRL) phase 03, 3f" appears when you open Windows.

- A device conflict occurs between the native Windows 32-bit access driver and drives larger than 528 Mbytes. To get the advantages of 32-bit disk access and more, install the SEG32BIT 32-bit access driver. See the instructions in the "Windows 32-bit disk access" section on page 29.

Disabling EZ-Drive

- You can disable the EZ-Drive banner that appears when you boot your computer by removing the EZ-Drive boot information written to the boot sector of Drive C. Your computer will stop accessing EZ-Drive-installed drives larger than 528 Mbytes. The data files are not affected. For this operation, you need a bootable diskette and a diskette that has the FDISK utility.

Note. Before you disable EZ-Drive, back up your data files.

1. Turn the computer off.
2. Insert a bootable diskette into Drive A and turn the computer on. Your computer must boot to Drive A without loading EZ-Drive into the system memory.
3. When the boot cycle is complete, place a diskette that has the FDISK utility into Drive A if it is not on the boot diskette.
4. Type **fdisk/mbr** and press ENTER. This command erases the EZ-Drive-modified master boot record on Drive C and replaces it with the standard DOS master boot record. The computer can no longer identify drives larger than 528 Mbytes installed using EZ-Drive. You must partition and format the drive to make it accessible (see "Partitioning and formatting" on page 21).

Disabling Maximum Overdrive

- Maximum Overdrive enables the drive's read/write multiple feature. You can disable Maximum Overdrive during the installation process or anytime afterward.
- To disable it during the installation, select the Change Install Features option in the Options dialog box that appears when the format completes. This feature allows you to enable or disable Maximum Overdrive.
- You can disable Maximum Overdrive anytime after the drive has been installed.

1. Insert the EZ-Drive diskette into the diskette drive.
2. Type **ez** at the command line.

3. Press ENTER until the Select Installation Type dialog box appears.
4. Select Installation Options and press ENTER.
5. Select Change Installed Features and press ENTER.
6. Select Maximum Overdrive. Press ENTER to change the status.
7. Select Save Changes press ENTER to save the change.

Additional EZ-Drive troubleshooting and help information is available when you select Information Help in the Select Installation Type dialog box.

Answers to frequently asked troubleshooting questions are available in the EZ-HELP.EXE file on the diskette.

Technical support services

If you need assistance installing your drive, consult your dealer. Your dealer is familiar with system configurations and can help you with system conflicts and other technical issues.

If you need additional assistance with your Seagate drive or other Seagate products, you can call SeaBOARD™, SeaFAX™, Seagate Technical Support FAX, SeaFONE™ or SeaTDD™. Seagate technical support is also available on CompuServe.

SeaBOARD

Using a modem, you can access documentation, drive specifications and jumper settings for Seagate's entire product line. You can also download software for installing and analyzing your drive.

SeaBOARD is available 24 hours daily. It supports communications up to 9,600 baud. Set your communications software to eight data bits, no parity and one stop bit (8-N-1). SeaBOARD phone numbers are listed in the following table.

Location	Modem number
United States	408-438-8771
England	44-1-62-847-8011
France	(+33 1) 48 25 35 95
Germany	49-89-140-9331
Singapore	65-292-6973

Location	Modem number
Thailand	662-531-8111
Australia	61-2-756-2359
Korea	82-2-556-7294

SeaFAX

You can use a touch-tone telephone to access Seagate's automated FAX system to receive technical support information by return FAX. This service is available 24 hours daily.

Location	Telephone number
United States	408-438-2620
England	44-1-62-847-7080

Seagate Technical Support FAX. 408/438-8137

You can FAX questions or comments to technical support specialists 24 hours daily. Responses are sent between 8:00 A.M. and 5:00 P.M. (Pacific time) Monday through Friday.

SeaFONE. 408/438-8222

You can talk to a technical support specialist between 8:00 A.M. and 5:00 P.M. (Pacific time) Monday through Friday. SeaFONE provides recorded technical information on selected Seagate products while you are on hold. You can access the recordings 24 hours daily. Before calling, note your system configuration and drive model number (ST*xxxx*).

SeaTDD. 408/438-5382

Using a telecommunications device for the deaf (TDD), you can send questions or comments 24 hours daily and exchange messages with a technical support specialist between 8:00 A.M. and 5:00 P.M. (Pacific time) Monday through Friday.

SeaBOARD CompuServe forum

Online technical support for Seagate products is available on CompuServe. To access our technical support forum, type **go seagate**. This forum provides information similar to that found on SeaBOARD.

Seagate's Internet connections

Technical information for Seagate drives is available on the internet from Seagate's World Wide Web home page (http://www.seagate.com) or Seagate's ftp server (ftp://ftp.seagate.com). The ftp server contains information similar to that found on SeaBOARD.

Storing and shipping your drive

Keep your original box and packing materials for storing or shipping your drive. The box has a *Seagate Approved Package* label. Shipping a drive in an unapproved container voids the warranty. Call your authorized Seagate distributor to purchase additional boxes.

The following figure shows how a drive fits in an approved single-pack box, including the packing materials.

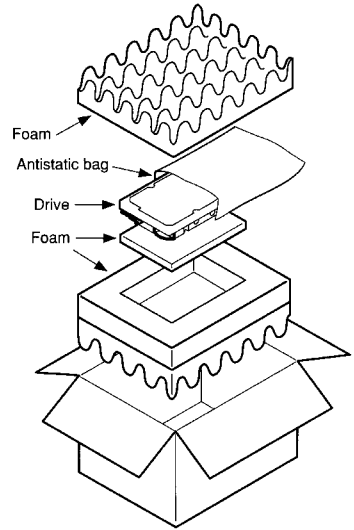


Figure 6. A drive in an approved package

Errata

The 32-bit disk access software driver for Windows that comes with your drive is MH32BIT.386. It allows you to use the 32-bit disk access feature with drives above 528 Mbytes. If you are using 32-bit disk access, an error message appears when you load Windows after you have installed your new drive. The following tells you how to handle the error message, how to disable the native driver and how to install MH32BIT.386.

1. Press ENTER to open Windows.
2. Open the Main window.
3. Open the Control Panel.
4. Select Virtual Memory.
5. Select Change.
6. Deselect 32-Bit Disk Access at the bottom of the screen.
7. Select OK. Follow the screen instructions to reboot.

To install MH32BIT.386:

1. Load Windows.
2. Open the Program Manager menu and select File.
3. Select Run.
4. Load the EZ-Drive diskette.
5. In the command line box, type ***drive*:Setup**.
6. Select Install Driver. This loads the MH32BIT.386 replacement driver designed to work with EZ-Drive.
7. Select Restart Windows.

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